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Biocompatibility investigation of polypropylene endoprosthesis using atomic force microscopy

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Abstract

At present it is scientifically and clinically proved that the main cause of relapses, which occur after difficult surgical operations involving the use of implants, is the fact that organism's own tissues can't fuse with an implant. As a result of this the topical problem is to increase the biological compatibility of applied materials. As the processes of the implant rejection take place at the cellular level, elaboration of modern methods to research and control these processes with appropriate spatial resolution is a very important problem. In this paper, by the example of a mesh polypropylene endoprosthesis, the way to study some physical properties of the biomaterial with the help of AFM is shown. The results obtained demonstrate that AFM and AFS allow one to investigate the inner structure of a polypropylene fiber and a series of physical parameters involved in regeneration. The studies carried out with the help of AFM allow us to analyze the processes taking place on the surface and in the inner structure of a polymer applied in medicine and biology and to conclude about the reliable fixation of an implant. © IDOSI Publications, 2013.

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Keywords

AFM, Biological compatibility, Endoprosthesis